NOTE XXV.

REVISION OF THE MANIDAE IN THE LEYDEN MUSEUM

BY

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Having been occupied for some time with a detailed and close examination of the specimens belonging to this group of Ant-eaters which form part of our collections, I have been led to observe certain points in the external form and in the structure of the skeletons which appear to me to be not without interest as these facts throw a clearer light upon the classification of these curious creatures. I wish to give a short exposition of them before proceeding to an enumeration of our individuals.

The observations which I have been able to make have been repeatedly confirmed and controlled by myself thanks to our unequaled and nearly complete collection of stuffed specimens and individuals in spirits, of skeletons and skulls, embracing all the species hitherto known.

In the year 1834 Bennett, P. Z. S. L. p. 82, cited as a particuliarity in the distribution of the scales of *Manis temminckii:* »the cessation of the middle series of them at a »short distance anterior to the extremity of the tail, so »that the last four transverse rows consist of four scales

»each, each of the preceding ones having five." — Focillon, Revue et Magasin de Zoologie, 1850, p. p. 465—475 and 513—535. stated in the descriptions of the several species, which he accepted, that this »cessation" is to be found in *Manis longicaudata*, *tricuspis*, *tridentata* and *temminckii*, and not in *Manis guy*, *javanica*, *aspera*, *dalmanni* and *laticaudata*, but he entirely overlooked the fact that the species showing this peculiarity are exclusively inhabitants of Africa whereas the other ones without exception inhabit Asia and the Islands of the Indian Archipelago. I can indeed confirm that this discontinuity of the median series of scales at a short distance from the tip of the tail is a characteristic of all the African species, including *Manis gigantea*, this species not having been distinguished with accuracy at the time that Focillon wrote his monograph. On the other hand all the Asian and Indian species have the central series uninterrupted down to the end of the tail. By this very constant character it is indeed easy to settle certain questionable points in descriptions of Wagner, Focillon and other authors. Wagner describes the number of scales of the tail of an individual of *Manis javanica*, but writes; »Auf dem Schwanze »finden sich, so weit die Mittelreihe des Rückens sich auf »ihm fortsetzt nur 5 Längsreihen; wo die Mittelreihe auf»hört, folgen sich nur noch 4 Längsreihen." From this it is evident that Wagner's specimen, *Manis wagneri* Fitzinger, can never have belonged to *Manis javanica*, which has always an uninterrupted median series of scales on its tail: the rule above given clearly shows that it is an African species and I am convinced that it is nothing else than *Manis gigantea*. — We find another example in *Manis guy* Focillon. As to the habitat of this species the author says: »Ce Pangolin est orginaire d'Afrique, et, sauf un exem»plaire du *Manis javanica*, encore jeune, que M. Guy af»firme positivement lui être venu de l'Afrique, mais qui, »sans doute, n'avait fait qu' y passer, etc." I believe that the true *Manis guy* similarly only passed through

Africa, as it possesses according to Focillon's description an uninterrupted line of scales on the tail. Without the slightest hesitation I agree with Gray 1) believing that it is only a young specimen of *Manis javanica*. — As a third example I wish to cite *Manis leptura* Blyth 2). The native locality of this species was unknown and Blyth terminates the description in the following terms: »altogether, this »species presents a marked approximation to the long- »tailed Pangolins of Africa." His assertion however, that there is a central row from the occiput to the tail-tip, points out precisely that his *Manis* is not an African form.

A second point to which I call the attention of naturalists is the following. Focillon 3) remarks as to his *Manis guy:* »la queue se termine, en dessous par un es- »pace nu, pulpeux, et qui peut, pour l'aspect, se comparer »exactement à la plante des pieds de l'animal. C'est, je »crois, un organe de toucher grossier et en même temps »un point de sustentation." Motley and Dillwyn 4) describe the tail of *Manis javanica* as being powerfully prehensile and furnished with a little naked callosity. An examination of our specimens has proved that in all the species the end of the tail is naked on its lower surface, only with two exceptions, viz: *Manis gigantea* and *temminckii*.

It is a long-known fact, that in certain species of *Manis* a small number of bristles protrude from beneath every scale, and I also find these bristles very constantly, but only in the Asian and Indian species and not a trace of it in the African ones, if adult. However a young *Manis gigantea* in our collection und a young *Manis longicaudata*, cited by Thompson 5) are armed with spiny hairs or bristles, although they never are to be found in the fullgrown

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1) P. Z. S. L. 1865. p. 366.
2) J. As. S. B. 1842. p. 454; 1847. p. 1247.
3) Revue et Magasin de Zoologie. 1850. p. 514.
4) N. H. Labuan. p. 51.
5) P. Z. S. L. 1834. p. 29.

African species, and thus this may be looked upon as being a characteristic difference between the Indian and African *Manidae*, when fullgrown.

Judging from the material at my disposition, it seems to me that the external ear-conch is always conspicuous, but that there are degrees in its development, in as much as they are largest in the species of the Indian Continent, smaller in those of the Indian Archipelago, whereas the African species have them very small.

The number of the rows of scales and the number of scales in each row, especially of the tail, has always taken a conspicuous part in descriptions and determinations of the several species and has given rise to the creation of numerous species, which on closer examination could not hold their ground. Two principal points have to be kept in mind: 1°. where the tail begins and 2°. whether the number of rows and of scales in each row in the same species is constant or not? As to the first point I must observe that the tail when seen from above constantly presents five rows of scales, the outer ones very characteristically and rectangularly curved inwards: I propose to call the first so shaped scale the first scale of the tail. From this scale I count backwards and upwards along the transverse series of scales and the median dorsal scale thus attained similarly ranks as first scale on the tail. This nomenclature was adopted (although the actual length of the tail is not determined in the same way, but by measuring the distance from the anus to the tip of the tail) because it is the only conventional system of counting the rows of scales on the tail which can be applied both to the African and Indian species. Moreover according to this plan the number of median tail-scales corresponds exactly to that of the marginal ones. An answer to the second question is thus obtained at the same time. As an example I take *Manis javanica*; of this species I have before me a large series from Salanga, Sumatra, Java, Banka and Borneo. I find the following numbers:

a specimen from Java measuring about 25 c. m. with 25 scales in the middle row of the tail.

a	specimen	from	Java	meas.	about	39	c. m.	with	24	scales.
»	»	»	Banka	»	»	40	»	»	29	»
»	»	»	Java	»	»	50	»	»	25	»
»	»	»	?	»	»	58	»	»	24	»
»	»	»	Java	»	»	58	»	»	24	»
»	»	»	»	»	»	70	»	»	21	»
»	»	»	Salanga	»	»	80	»	»	27	»
»	»	»	Borneo	»	»	81	»	»	23	»
»	»	»	Sumatra	»	»	84	»	»	25	»
»	»	»	Java	»	»	100	»	»	22	»
»	»	»	»	»	»	100	»	»	27	»
»	»	»	Borneo	»	»	116	»	»	26	»

The conclusion must necessarily be that the number of scales of the tail in this species is entirely independent of age or locality, is very inconstant and varies between 21 and 29, thus always exceeding 20. The specimens of other species present analogous phenomena and in conclusion I may remark that neither the number of scales of the head, nor those of the back, nor those of the underparts of the tail, nor even the number of rows of the back are constant in the same species, but that they vary between certain limits in the same way as it was just now demonstrated for the tail of *Manis javanica*.

Without entering in osteological details I will summarize what a comparison of our skeletons teaches as to the number of vertebrae, ribs, etc. Our collection contains only a single skeleton of each of the following species, viz: *Manis javanica*, *aurita*, *gigantea*, *temminckii*, *longicaudata* and *tricuspis*. As we possess no skeleton of *Manis crassicaudata* I cite the number of vertebrae given by Cuvier: this will facilitate comparison.

	Cerv.	Cost.	Lumb.	Sacr.	Caud.	
Manis javanica	7 +	15 +	5 +	4 +	30	= 61
» aurita	7 +	16 +	6 +	3 +	27	= 59
» crassicaudata	7 +	15 (16) +	6 (5) +	3 +	26	= 57 apud Cuv.

Manis gigantea 7 + 14 + 5 + 4 + 27 = 57
» temminckii 7 + 12 + 5 + 3 + 21 = 48
» longicaudata 7 + 13 + 6 + 2 + 38 1) = more than 70.
» tricuspis 7 + 13 + 6 + 2 + 41 = 69.

I cannot make out whether the hindmost part of the sternum presents the curious elongated shape, *processus xiphoïdeus*, in all the species, I can only confirm it for *Manis longicaudata* and *gigantea*. It is always cartilaginous and thus easily severed when the skeleton is being prepared. Guy (l. c. p. 532) has found it in *Manis longicaudata*, and also in *tricuspis* (*tridentata* Guy) and *temminckii*. Cuvier figures it in the skeleton of his Pangolin à courte queue. It thus is very probable that it will turn out to be peculiar to all the species of the Genus *Manis*. A hitherto unmentioned fact is that the vertebrae of the tail of *M. longicaudata* and *javanica* present no trace of *haemapophyses*, meanwhile these bones are very well devoloped in the other skeletons which I examined and also in Cuvier's figure of the skeleton of *M. crassicaudata*. It must be remembered that in all the species the phalanges bearing the claws are bifid (*Manis ceonyx* apud Rafinesque).

The skulls in the different species present very striking differences, but I believe it to be prudent to obstain from conclusions, until a more complete collection of fullgrown specimens of each species can be compared.

As to the synonymy I have only to add that the descriptions given by Brisson, Linnaeus, Erxleben, Desmarest and others are generally so short and incorrect and the localities so confused, that I pass them over in silence, although I will always endeavour to preserve specific names given by those authors, when it is in any way possible.

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1) Tail incomplete, tip wanting. According to Cuvier there are 47 caudales.

A. Central row of scales of tail uninterrupted down to the tip. Bristles between the scales. — *Manidae from the Indian Continent and from the Malay Archipelago.*

α. More than 20 scales on the median row of the tail.

1. *Manis javanica.*

1820. *Manis javanica* Desmarest. Mammalogie. p. 377.
1822. *Manis pentadactyla* Raffles. Linn. Transact. p. 249.
1842. *Manis (Pholidotus) aspera* Sundevall. K. Vet. Acad. Handl. p. 253. T. IV, fig. 11. — *Manis leptura* Blyth. J. A. S. B. p. 454.
1847. *Manis leucura* and *leptura* Blyth. J. A. S. B. p. p. 1273 and 1274.
1850. *Manis guy* Focillon. Revue et Magasin de Zoologie. p. 513. Pl. 10.
1865. *Pholidotus javanus* Gray. P. Z. S. L. p. 366.
1872. *Pholidotus gouyi* Fitzinger. Sitzb. d. K. Akad. d. Wisschensch. Wien. p. 29; *Ph. asper* Fitz. l. c. p. 32; *Ph. malaccensis* Fitz. l. c. p. 42; *Ph. leucurus* Fitz. l. c. p. 44; *Ph. lepturus* Fitz. l. c. p. 46; *Ph. labuanus* Fitz. l. c. p. 48.
1873. *Pholidotus javanus* Gray. Handlist of the Edentate, Thick-skinned and Ruminant Mammals. p. 8.

Outside of fore and hind legs covered with scales. End of tail naked on its lower surface. Claws of hind feet nearly equal to those of fore feet. The number of scales in the middle row of the tail varies between 20 and 30. Body with 19 longitudinal series of scales. Nearly always keeled scales on the sides of the body and on the hindfeet.

Hab. Burma, Arakan to Mergui (Blyth); Malacca, Poeloe Pinang (Cantor), Singapore (B. M.); Salanga-island (v. Maltzan); Sumatra; Poeloe Nias (v. Rosenberg); Banka (Teysmann); Biliton and Karimata-Islands (Valentijn); Java; Madura (Valentijn); Borneo; Celebes, Macassar (Valentijn).

Mounted specimens in the Leyden Museum:

1. Female. Salanga-islands. H. v. Maltzan. 1881. Longitudo: 80 c. m. — 2. Nearly fullgrown individual. Sumatra. 1877. Joh. F. Snelleman. Long: 84 c. m. — 3. Young individual. Banka. v. d. Bossche. 1861 (in spirits). Long: 40 c.m. — 4. Adult. Borneo, Banjer Massing. Schwaner. 1845. Long: 116 c. m. — 5. Female. E. S. E. Borneo. C. Bock. 1879. Long: 81 c. m. — 6. Adult male. Java. Long: 100 c. m. — 7. Adult male. Java. Macklot. Long: 100 c. m. — 8. Nearly fullgrown individual (in spirits). Java, Malang. Hildebrand. 1872. Long: 70 c. m. — 9. Young individual. Lidth de Jeude. 1866. Long: 58 c. m. 10. Young individual. Java. Diard. Long: 58 c. m. — 11. Young individual. Java. Diard. Long: 50. c. m. — 12. Very young individual. Java. Kuhl and v. Hasselt. Long: 39 c. m. — 13. Foetus. Java. Long: 25 c. m.

14. Skeleton of N°. 9.

15. Skull of N°. 2. — 16. Adult skull. Java. Kuhl and v. Hasselt. — 17. Young skull, locality unknown.

β. Less than 20 scales on the median row of the tail.

Two species belonging to this group are found in the Indian Continent, a large and a small-scaled one. The first species had been described very minutely by Buffon [1]), under the name *Pangolin*. In 1803 Et. Geof. St. Hilaire [2]) gave the name of *Manis crassicaudata* to Buffon's »Pangolin". The second or small scaled species has been described by Hodgson [3]) under the name of *Manis auritus*. It is a very curious fact that Sundevall has entirely overlooked the above named descriptions of Geoffroy and Hodgson, when he wrote his very useful »Ofversigt af slägtet Manis" [4]). This is the more surprising as he adds a very

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1) Histoire naturelle. 1763. T. X. p. p. 187—192. Pls. XXXIV and XXXVI, figs. 1 and 2.

2) Catalogue des Mammifères 1803. p. 213.

3) J. As. Soc. Beng. 1836. p. 234.

4) K. Vet. Acad. Handl. 1842. p. p. 245—283.

complete »Expositio literaturae de Genere Manis". He accepted for the large scaled species Illiger's name [1]), viz: *laticauda* (*laticaudata Ill.*) and described the other species as new, under the name of *Manis dalmanni.* It might have been an easy task for the late Gray to settle the question having as he had, a large number of specimens collected by Hodgson in Nepaul and by Swinhoe in China, Formosa and Hainan at his disposition. However a comparison of his statements with the individuals in our collection convinces me that he has even augmented the confusion. In 1843 [2]) *Manis auritus* Hodgson was according to Gray nothing else than *Manis pentadactyla* L. In 1865 [3]) Gray identified this species with *Pholidotus dalmanni* Sund. In his Catalogue (1869) Gray did not alter this opinion, but in his Handlist (1873) he cites *Manis auritus* Hodgson under *Pangolin indicus*, thus arranging it even in another genus. Nevertheless he gives no reason whatever for his doing so. I can only explain this strange behaviour as follows. I have before me three original specimens of Hodgson's from Nepaul, labelled *Manis aurita* Hodgson, which entirely agree with Hodgson's description published in 1836 and with Sundevall's description of *Manis dalmanni.* This puts beyond all doubt the fact that the small-scaled *Manis* inhabits Nepaul. In 1873 Gray brings all the skins from Nepaul which were collected by Hodgson under the head of *Pangolin indicus*, which species has larger scales and a smaller number of rows of scales on the body than Hodgson's true *auritus.* I thus conclude that Hodgson has collected in Nepaul two species of Ant-eaters, *M. aurita* and *M. crassicaudata* or the small and the large-scaled *Manis*; specimens of both these species must be in the Britsh Museum and when Gray wrote in 1865 he must have had before him a specimen of the small-scaled species, whereas in 1873 he examined and described a large-scaled specimen.

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1) Abh. d. Kön. Akad. d. Wissensch. Berlin. 1815. p. 90.

2) List of the specimens in the Britsh Museum. 1843. p. 188.

3) P. Z. S. L. 1865. p. 366.

2. *Manis aurita.*

1836. *Manis auritus* Hodgson. J. A. S. B. p. 234.
1842. *Manis* (*Pholidotus*) *dalmanni* Sundevall. K. Vet. Acad. Handl. p. 256. T. IV. fig. 10 (claw).
1872. *Pholidotus assamensis* Fitzinger. Sitzb. d. K. Ac. Wissensch. Wien. p. 49.

Outside of fore and hind feet covered with scales. End of tail naked on its lower surface. Claws of hind feet much smaller than those of fore feet. Body with 17 longitudinal series of scales. In young specimens the scales of the sides of the body and those of the hind feet strongly keeled. At that age all the scales present a peculiar purplish brown shining color [1]), in adult specimens they are of a blackish brown color.

Hab. China; Formosa and Hainan (Swinhoe); Nepaul (Hodgson); Upper Assam (Mc. Clelland); Western Yunnan (Anderson).

Mounted specimens in the Leyden Museum:

1. Female. China, Amoy. G. Schlegel. 10 febr. 1862. Long: head and body 30 c. m., tail 18 c. m. Tail with 17 scales. — 2. Male (in spirits). China, Amoy. G. Schlegel. 20 febr. 1862. Long: head and body 31 c. m., tail 19.5 c. m. Tail with 19 scales. — 3. Male (in spirits). China, Amoy. G. Schlegel. 20 febr. 1862. Long. head and body 25 c. m., tail 15 c. m. Tail with 17 scales. — 4. Male (in spirits). Amoy. G. Schlegel. 20 febr. 1862. Long: head and body 26 c. m., tail 17 c. m. Tail with 16 scales. — 5. Adult. Nepaul. Hodgson. Long: head and body 60 c. m., tail 40 c. m. Tail with 17 scales — 6. Nearly fullgrown individual. Nepaul. Hodgson. Long: head and body 56 c. m., tail 31 c. m. Tail with 17 scales. — 7. Nearly fullgrown individual. Nepaul. Hodgson. Long: head and body 53 c. m., tail 29 c. m. Tail with 16 scales.

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1) Swinhoe very appropriately compared the scales of the young individuals with the side-pieces of an acorn-barnacle (Balanus).

8. Skeleton of N°. 1.

Notwithstanding Hodgson has proposed to change the name of *auritus* into *plurisquamis*, if it was proved that the genus *Manis* is not earless, the epithet *auritus* thus ceasing to be characteristic, I have retained the specific title *auritus*, 1°. because this species has the largest ears among all the species of *Manis* hitherto known, 2°. to avoid further confusion and 3°. because the name *plurisquamis* signifies the same as *multiscutata*, a name given by Gray in 1843 to an African *Manis*, viz: *Manis tricuspis*.

It is still questionable whether a *Manis* occurs in Japan. Temminck (Fauna japonica p. 6) mentions that v. Siebold has sent over to our Museum two pieces of the skin of a *Manis* from Japan. But as at present these fragments are not to be found in our collection, it is as yet impossible to make out to what species they belonged. Mr. Serrurier, director of the Leyden Ethnographical Museum, kindly informed me at my request that in the Japanese books at his disposition he finds nothing justifying the conclusion that the Ant-eaters should be inhabitants of Japan, but it appears that the Japanese introduce them from China for medical purposes. The Japanese relate that the Ant-eaters catch Ants in the following way: The Manis erects its scales and feigns to be dead; the Ants creep between the erected scales, after which the Ant-eater again closes its scales and enters the water; he now again erects the scales, the Ants are set floating and are then swallowed by the Ant-eater.

3. *Manis crassicaudata.*

1803. *Manis crassicaudata.* Et. G. H. Hilaire. Catalogue des Mammifères. p. 213.
1834. *Manis indicus* Lesson. Suite des Mammifères. T. IV. p. 520.
1842. *Manis* (*Phatages*) *laticauda.* Sundevall. K. Vet. Acad. Handl. p. 258.

1843. *Manis pentadactyla* Gray. Catalogue. p. 188. (partim).
1852. *Manis crassicaudata* Kelaart. Prodromus faunae ceylanicae. p. 74.
1872. *Pholidotus laticaudatus* Fitzinger. Sitzb. d. Ak. d. Wisschensch. Wien. p. 59; *Ph. bengalensis* Fitz. l.c. p. 64.

Outside of fore and hind legs covered with scales. End of tail naked on its lower surface. Claws of hind feet much smaller than those of fore feet. Body with 11 or 13 longitudinal series of scales. Scales of the sides of the body and those of the hind feet not keeled. The scales are about twice as large as those of *Manis aurita* and *javanica*. The color of the scales is a fine pale yellow brown.

Hab. ? Nepaul (Hodgson); Bengal (Meyer); Hindustan (Tickel); Dukhun (Sykes); Madras; Pondicherry; Ceylon (Kelaart).

Mounted specimens in the Leyden Museum:

1. Fullgrown individual. Ceylon. Long: head and body 62.5 c. m., tail 46 c. m. Tail with 15 scales. — 2. Young individual. Ceylon. Long: head and body 45 c. m., tail 33 c. m. Tail with 14 scales.

3. Skull of an adult specimen.

B. Central row of scales of tail interrupted at some distance from the tip. No bristles between the scales. *Manidae from Africa.*

α. Outside of fore and hind legs covered with scales. Tail on its lower surface without naked patch. Scales not keeled. Claws of hind feet much smaller than those of fore feet. Tail shorter than head and body.

4. *Manis gigantea.*

1815. *Manis gigantea* Illiger. Abh. d. K. Ak. d. Wissensch. Berlin. p. 84.
1865. *Pholidotus africanus* Gray. P. Z. S. L. p. 368. Pl. XVII, and woodcuts of skulls.

1869. *Pholidotus giganteus* Gray. Catalogue. p. 373. Fig. 44 (Skull).

1872. *Phatages giganteus* Fitzinger. Sitzb. d. K. Akad. Wien. p. 67; *Ph. wagneri* Fitz. l. c. p. 40.

1873. *Pangolin giganteus* Gray. Handlist. p. 9.

Tail shorter than head and body; tapering to the end. Body covered with 17 longitudinal series of scales. Tail with from 15 to 19 marginal scales; the interrupted middle row of the tail consists of from 12 to 15 scales, followed by two rows of from 3 to 4 scales each.

Hab. Liberia (Büttikofer and Sala); Niger (Baikie); Gaboon (British Museum); Vernando-Vaz, Nkongon, Mboumba, about 2° South of the Equator (Du Chaillu).

Mounted specimens in the Leyden Museum:

1. Male. Liberia, Grand Cape Mount. Büttikofer. 13 October 1881. Long: head and body 79 c. m., tail 64.5 c. m. — 2. Young individual (in spirits), from unknown locality. Lidth de Jeude. Long: head and body 22 c. m., tail 15 c. m.

3. Skeleton of N°. 1.

Illiger contents himself with giving a new name, *Manis gigantea*, to a species which he distinguished in the following short terms: »das Guineische Schuppenthier, das im »Verzeichnisse *Manis gigantea* heisst, ist mit Unrecht mit »der Ost-Indischen *Manis brachyura* verbunden; es wird »4 Fuss, dieses nur anderthalb Fuss lang." Although this observation can hardly be called a diagnosis, I follow Gray in applying this name to our species, because it is the only African form of *Manis* which may to a certain extent be compared with an Indian species: it is thus very probable that Illiger actually had a specimen of our species before him.

5. *Manis temminckii.*

1832. *Manis temminckii* Smuts. Enumeratio mammalium capensium. p. 54. T. III. figs. 1 and 2 (Cranium).

1834. *Manis temminckii* Bennett. P. Z. S. L. p. 81.
1842. *Manis (Phatages) temminckii* Sundevall. K. Vet. Ac. Handl. p. 260. T. IV. figs. 2—9.
1838. *Manis temminckii* Smith. Illustr. of the Zoology of South Africa. Vol. I. T. 7.
1872. *Phatages hedenborgii* Fitzinger. Sitzb. d. k. Akad. Wien. p. 69; *Ph. temminckii* Fitz. l. c. p. 72.
1873. *Smutsia temminckii* Gray. Handlist. p. 11.

Tail very broad, rounded at the end. Body covered with 13 longitudinal series of scales. Tail with 13 marginal scales, the interrupted middle row of the tail consisting of 4 scales, followed by two rows of 9 scales each (see our n°. 1); or 11 marginal scales, with 7 on the middle row and two rows of 4 scales each (see our n°. 2).

Habitat Gold-coast (Leyden Museum); Angola, San Paolo de Loanda (Peters); Cape of Good Hope (v. Horstock, Steedman), Port Natal (Wahlberg); Senna (Kirk); Mozambique, Quellimane, Quitangonha, Cape Delgado (Peters); Makua country, Zanzibar (Holmwood); Somali-coast (v. Heuglin, Holmwood); Bahr-el-Abiad, Sennaar, Kordofan (v. Heuglin).

Mounted specimens in the Leyden Museum:

1. Female. Cape of Good Hope, Masilikats-land, Lattaku. v. Horstock. Long: head and body 49 c. m., tail 35 c. m. — 2. Halfgrown individual. Gold-coast. Frank. Long: head and body 39 c. m., tail 28 c. m.

3. Skeleton. Lattaku. v. Horstock. Type of the species.

4. Skull of N°. 1. — 5. Skull of N°. 2.

β. Outside of fore arm covered with hair. End of tail naked on its lower surface. Scales of hind feet and sides of body keeled. Claws of hind feet nearly equal to those of fore feet. Tail much longer than head and body.

6. *Manis longicaudata.*

1756. *Pholidotus longicaudatus* Brisson. Règne anim. p. 31.
1777. *Manis macroura* Erxleben. Mammalia. p. 101.

1820. *Manis africana* Desmarest. Mammalogie. p. 376.
1842. *Manis longicauda* Sundevall. K. Vet. Acad. Handl. p. 251.
1843. *Manis tetradactyla* Gray. Catalogue, p. 188.
1872. *Manis guineensis* Fitzinger. Sitzb. d. K. Ak. d. Wissensch. Wien. p. 16; *M. senegalensis* Fitz. l. c. p. 17.
1873. *Manis longicauda* Gray. Handlist. p. 6.

Scales large. All the scales of body and tail bordered with white. The body covered with 13 longitudinal rows of scales. All the naked parts densely covered with rather long dark-brown hairs. Tail with 44 marginal scales; the interrupted middle row of the tail consists of 34 or 35 scales, followed by two rows of 10 or 9 scales each.

Hab. Senegal (Mus. Paris); Liberia (Büttikofer and Sala); Coast of Guinea (Pel, Nagtglas); Sierra Leone (Thompson); Gaboon (Fitzinger).

Mounted specimens in the Leyden Museum:

1. Adult. Locality unknown. Long: head and body 35.5 c. m., tail 64.5 c. m. — 2. Adult. Gold-coast, Dabocrom. Pel. May 1846. Long: head and body 34.7 c. m., tail 60.7 c. m. — 3. Young individual. Gold-coast, Elmina. Nagtglas. Juli 1861. Long: head and body 20.5 c. m., tail 35 c. m.

4. Skeleton of an adult male. Liberia, Soforé-place. Büttikofer and Sala. 1880.

In 1853 (See Esquisses Zoologiques de Temminck p. 173) our collection contained three specimens of *M. longicaudata* viz. one from Senegal, one from Sierra Leone and another from the Gold-coast. The latter is my N° 2. My N° 1. is one of the two other specimens cited by Temminck, but as it bears no label, I cannot make out if it is from Senegal or from Sierra Leone. The third specimen is not to be found in our Museum.

Brisson's description of this species is so correct, that it cannot be confounded with any other species, although the author erroneously gives as habitat Brazil and Formosa. As the thumbs of *Manis longicaudata* are always very small, they have been overlooked by Brisson, Schreber, Linnaeus and others, although Erxleben in 1777 wrote, describing this species (his *Manis macroura*): »ungues »5—5 palmarum pollicis minimo vix apparente, inde *te»tradactyla* male dicta auctoribus." Buffon has confounded *Manis longicaudata* and *Manis tricuspis*. He regarded a specimen of the latter, which was characterized by three-pointed scales, as a young individual of his *Phatagin*. Desmarest baptized this species in 1820 in calling it *Manis africana*, a name also adopted by Lesson in 1834 and given in 1865 by Gray to the much shorter tailed *Manis gigantea* Illiger.

7. *Manis tricuspis.*

1820. *Manis tricuspis* Rafinesque. Ann. Gén. d. Sc. Phys. de Bruxelles. p. 214.
1843. *Manis multiscutata* Gray. P. Z. S. L. p. 22.
1849. *Manis multiscutata* Fraser. Zoologia typica. With a colored plate.
1850. *Manis tridentata* Focillon. Revue et Magasin de Zoologie. p. 472. Plate 11.
1872. *Triglochinopholis tricuspis* Fitzinger. Sitzb. d. k. Ak. d. Wisschensch. Wien. p. 19; *Trigl. multiscutata* Fitz. l. c. p. 23; *Trig. tridentata* Fitz. l. c. p. 25.
1873. *Phatagin tricuspis* Gray. Handlist. p. 7.

Scales small, tricuspidate and elongate. Body covered with 21 longitudinal rows of scales. All the naked parts closely covered with rather long white colored hairs. Tail with 34 till 37 marginal scales; the interrupted middle row of the tail consists of from 30 to 33 scales, followed by two rows each of from 3 to 6 scales.

Hab. Liberia (Büttikofer and Sala); Gold-coast (Pel, Nagtglas); Sierra Leone (Thompson); Fernando-Po (Fraser); Bembé (Monteiro); Ashango-land (Du Chaillu); Mozambique? (Guy, Peters).

Mounted specimens in the Leyden Museum:

1. An individual from unknown locality. Frank. 1877. Long: head and body 37 c. m., tail 50.5 c. m. Tail: marginal scales 36, above 31 × 3 and 5 × 2 scales. — 2. Half-grown individual. Gold-coast, Dabocrom. Pel. 1846. Long: head and body 30 c. m., tail 41 c. m. Tail: marginal scales 37, above 33 × 3 and 4 × 2 scales. — 3. Young specimen. Gold-coast, Dabocrom. Pel. 1846. Long: head and body 22.5 c. m., tail 28 c. m. Tail: marginal scales 36, above 30 × 3 and 6 × 2 scales. — 4. Young female (in spirits). Gold-coast. Nagtglas. Long: head and body 19 c. m., tail 27 c. m. Tail: marginal scales 37, above 31 × 3 and 6 × 2. — 5. Young male (in spirits). Liberia, Soforé-place, Buluma. Büttikofer and Sala. 22 febr. 1881. Long: head and body 12 c. m., tail 14.5 c. m. Tail: marginal scales 34, above 31 × 3 and 3 × 2 scales.

6. Skeleton of N°. 2.

7. Skull of N°. 1.

Recapitulation.

	Mounted skins.	Spirits.	Skel.	Skulls.
Manis javanica.	11	2	1	3
» aurita.	4	3	1	
» crassicaudata.	2			1
» gigantea.	1	1	1	
» temminckii.	2		1	2
» longicaudata.	3		1	
» tricuspis.	3	2	1	1
	26	8	6	7

P. S. Mr. Oldfield Thomas kindly imforms me that the four specimens of *Manis* from Nepaul by Hodgson have the body covered with 15 or 17 longitudinal series of scales. My hypothesis (see page 201) is therefore untenable, as it appears that Gray ascribed 13 longitudinal series to specimens with 15 or 17 series! The only species of *Manis* living in Nepaul thus is *Manis aurita* Hodgson.